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Contribution to the Natural History of the New Zealand Race of Men; being observations on their Stature, Weight, Size of Chest, and Physical Strength. By A. S. THOMSON, M.D., Surgeon, 58th Regt.

[Read before the Statistical Society, 16th January, 1854.]

IN submitting the following information on the physical development of the New Zealander, I trust that, although from the limited field of observation the conclusions are necessarily open to objection, the Society will regard them favourably, as being a contribution to an important branch of the natural history of this *race*, on which, so far as I am aware, no exact observations have yet been recorded.

Captain Cook observes, "The stature of the men in New Zealand is, in general, equal to the largest of those in Europe: they are stout, well-limbed, and fleshy;" and almost every succeeding writer has described them as a tall, strong, and well-proportioned race. Such statements, however, convey no definite information, nor do they furnish data by which to make a comparison with other races of men. With a view to supply this, I recorded the height of 147 men, above the age of puberty, who presented themselves at the military hospital in Auckland in April, 1849, for vaccination, the measurements being all taken without shoes or stockings. The results are shown in the following table:—

Height.	Number at each Height.	Height.	Number at each Height.
5 feet to 5 ft. 1 in.	6	5 ft. 7 in. to 5 ft. 8 in.	20
5 ft. 2 in. to 5 ft. 3 in.	1	5 ft. 8 in. to 5 ft. 9 in.	18
5 ft. 3 in. to 5 ft. 4 in.	2	5 ft. 9 in. to 5 ft. 10 in.	17
5 ft. 4 in. to 5 ft. 5 in.	9	5 ft. 10 in. to 5 ft. 11 in.	13
5 ft. 5 in. to 5 ft. 6 in.	20	5 ft. 11 in. to 6 ft.	3
5 ft. 6 in. to 5 ft. 7 in.	37	6 ft. 5½ inches	1

The average height of these 147 New Zealanders was 5 ft. 6¾ in. The average of 80 students of the University of Cambridge,* between 18 and 20 years of age, was 5 ft. 9¾ in., and that of upwards of 800 students in the University of Edinburgh,† comprehending English, Scotch, and Irish, was 5 ft. 8⅞ in., but from both of these an inch should be deducted for the shoes. The average height of 900 Belgians, taken by Quetelet from the government registers, was 5 ft. 4¾ in. Haller states the mean height of men in the temperate countries of Europe to be from 5 ft. 5 in. to 5 ft. 6 in.

From these statements it would appear that the New Zealanders are not so tall as the natives of Great Britain, but taller than the Belgians, or the men of the temperate countries of Europe. This is

* Quetelet's Treatise on Man. The materials were furnished to him by Professor Whewell.

† On the Results of Experiments made on the Weight, Height, and Strength of above 800 individuals. By James D. Forbes, Esq., F.R.S., L. and E., Professor of Natural Philosophy in the University of Edinburgh.—Read before the Royal Society of Edinburgh.

more clearly shown as regards the natives of Belgium and New Zealand respectively in the following table, in which the proportion per cent. at different heights is stated:—

Height.	New Zealanders.	Belgians.	Proportion per Cent.	
			New Zealanders.	Belgians.
4 ft. 11 in. to 5 ft. 2 in.	6	64	4·4	7·0
5 ft. 2 in. to 5 ft. 6 in.	32	510	22·0	56·6
5 ft. 6 in. to 5 ft. 10 in.	92	304	62·0	34·0
5 ft. 10 in. to 6 ft. 2 in.	16	20	11·0	2·2
Above 6 ft. 2 in.....	1	2	0·6	0·2
Total	147	900

It will be seen from this table that the proportion of New Zealanders of upwards of 5 ft. 6 in. is double that of the Belgians, while above 5 ft. 10 in. the proportion is as 11·6 to 2·4 respectively.

The following circumstances are stated by Villermé to influence the stature of man. "The human height becomes greater and the growth takes place more rapidly—*ceteris paribus*—in proportion as the country is richer, the comfort more general, houses, clothes, and nourishment better, and labour, fatigue, and privation, during infancy, less; or, in other words, the circumstances accompanying misery put off the period of the complete development of the body, and stunt human stature." These must, doubtless, exercise some influence on the growth, but their effect is much more marked on the muscular development and the rapidity of growth than upon the height, which seems rather to depend upon race. Thus the New Zealanders have worse houses and clothing, and more uncertain, if not poorer nourishment, than the natives of Belgium, and yet they are taller.

At the same time that I registered the height of the New Zealanders I had them carefully weighed in a common lever balance, and the following are the results, deducting the weight of clothes and mats:—

Weight in lbs.	Number at each Weight.	Weight in lbs.	Number at each Weight.
112 to 118	4	161 to 167	8
119 „ 125	11	168 „ 174	9
126 „ 132	13	175 „ 181	1
133 „ 139	28	182 „ 188	2
140 „ 146	26	Total	146
147 „ 153	26		
154 „ 160	18		

The average weight of these 146 men, without their clothes and mats, was 140 lbs., or ten stone. They were principally either Waikato natives or men employed on the government works, both of which classes are usually better fed than the natives generally.

The following statements, derived from various observations made

on natives of Europe, furnish data for comparison with these results. In all of them one-eighteenth has been deducted from the total for the weight of clothes.

The average weight of 1,778 British soldiers serving in New Zealand, whose mean age was 27 years, amounted to 142 lbs.

Eighty students of the University of Cambridge, between the ages of 18 and 23, weighed on an average 143 lbs. each. Sixty men of the village of Massey, in the environs of Paris, averaged 136 lbs. each.

The average weight of Belgians between 18 and 40 years of age, as given by Quetelet, is 135 lbs.

The average weight of several hundred students in the University of Edinburgh, from 15 to 25 years of age, amounted to 140 lbs.

The average obtained by Dr. Hutchinson* from 2,648 observations on Englishmen in the prime of life, and between 5 feet and 6 feet in height, was 148 lbs.

From these results it appears that the average weight of the New Zealanders is rather under that of the natives of Great Britain, and above that of the Belgians and French.

On the Influence of Age on the Weight of New Zealanders.

The following table shows the *weight* of New Zealanders, as compared with British soldiers stationed in New Zealand, students of the University of Edinburgh, and natives of Belgium at different periods of life.

Ages.	New Zealanders.		British Soldiers.		Students at the University of Edinburgh. Average Weight.	Belgians. Average Weight.
	Number Observed.	Average Weight.	Number Observed.	Average Weight.		
From 16 to 20 years	45	lbs. 133	117	lbs. 132 $\frac{3}{4}$	lbs. 136	121
„ 21 „ 25 „	40	145	751	142 $\frac{3}{4}$	143	138
„ 26 „ 30 „	47	145 $\frac{1}{4}$	560	144	140
30 and upwards.....	11	150	350	139	140 $\frac{1}{4}$

This shows the New Zealanders to be as well developed at 20 years of age as either the British soldiers or the students of the University of Edinburgh, and much more so than the natives of Belgium. But the results are liable to exception, because the New Zealanders could afford no correct information as to their age, and I was consequently compelled to infer it from their general appearance.

On the Influence of Stature on the Weight of New Zealanders.

The following table shows the average weight of the natives of New Zealand and of Great Britain, and also of British soldiers serving in New Zealand, grouped according to stature :—

* On the Capacity of the Lungs, and on the Respiratory Functions. By J. Hutchinson.—*Medico-Chirurgical Transactions*, vol. xxix.

	New Zealanders.		Natives of Great Britain.*		British Soldiers in New Zealand.	
	Number of Observations.	Average Weight.	Number of Observations.	Average Weight.	Number of Observations.	Average Weight.
5 ft. to 5 ft. 4 in.	18	121 $\frac{3}{4}$	310	127
5 ft. 5 inches	20	134	214	137	97	133
5 ft. 6 " 	36	139	316	136 $\frac{1}{2}$	411	136 $\frac{3}{4}$
5 ft. 7 " 	20	142	379	144	432	141 $\frac{1}{2}$
5 ft. 8 " 	18	149	468	149	335	146 $\frac{1}{2}$
5 ft. 9 " 	17	148	368	157	188	148 $\frac{1}{2}$
5 ft. 10 in. & upwards	17	158	593	164	169	160

* Dr. Hutchinson's paper in the Medico-Chirurgical Transactions, already quoted.

This table shows more clearly than any other the development of the New Zealand race. The remarkable similarity in the results of the three classes included in it cannot fail to attract attention. The slight discrepancies are probably attributable to the small number of New Zealanders who came under observation. I was, unfortunately, compelled to give up the investigation, in consequence of inquiries being addressed to the Government by influential natives regarding my object.

The New Zealanders, like all men in a savage state, are indolent and lazy, working only when an absolute necessity for so doing exists. A few days' labour will enable them to plant enough potatoes to sustain life for a year, and to rear a few pigs to exchange for blankets and tobacco. The greater part of their time is spent in a dreamy state of indolence, smoking, talking, and reading. The latter is a newly-acquired taste, but is very common. I have seen them peruse an article in the native newspaper and sit up all night to talk about it. This idle mode of life tends to develop the accumulation of fat, and to increase the weight of the body. The women do much of the hard work, and as the men advance in life they become more lazy and indolent.

On the Chest Development of the New Zealanders.

There is a popular opinion that men with large chests are able to undergo much labour and to endure great fatigue; I therefore measured the circumference of the chest of 151 New Zealanders, and obtained the following results:—

Circumference of Chest.	Number of each size.	Circumference of Chest.	Number of each size.
29 and under 30 inches ..	1	35 and under 36 inches....	33
30 " 31 " 	2	36 " 37 " 	28
31 " 32 " 	3	37 " 38 " 	23
32 " 33 " 	14	38 " 39 " 	9
33 " 34 " 	9	39 " 40 " 	3
34 " 35 " 	25	40 $\frac{1}{2}$ inches	1

The mean of the whole was 35·56 inches.

The measurements were made by passing a measuring-tape round the chest on a level with the nipple, the arms being raised above the head so as to remove as much of the muscular substance as possible. During the time of measurement the person was engaged in conversation, to prevent the chest being unusually distended with air.

To obtain data for comparison with Europeans, I measured in precisely the same manner, and with the same tape, 628 men of the 58th Regt., and found the mean size was 35·71 inches. The following table shows the numbers of each size :—

Circumference of Chest.	Number of each size.	Circumference of Chest.	Number of each size.
29 and under 30 inches	1	37 and under 38 inches ...	85
30 " 31 " 	1	38 " 39 " 	56
31 " 32 " 	6	39 " 40 " 	19
32 " 33 " 	27	40 " 41 " 	7
33 " 34 " 	49	41 " 42 "
34 " 35 " 	97	42 " 43 " 	1
35 " 36 " 	145	43 inches	1
36 " 37 " 	133		

As the chest development, however, is considerably influenced by age, I have, for the purpose of comparison, classed the results in the following table according to ages :—

Ages.	New Zealanders.		Soldiers of 58th Regiment.	
	Number Examined.	Average Circumference of Chest.	Number Examined.	Average Circumference of Chest.
16 to 20 years	46	Inches. 33·32	47	Inches. 34·90
20 " 25 " 	40	35·82	274	35·55
25 " 30 " 	47	35·92	213	35·91
30 yrs. and upwards	11	35·95	83	35·76
Total	144	35·26	617	35·71

Thus it will be seen that the measurements in both classes approximate very closely, except for those under 20 years. The average size of the chests of the soldiers is higher than that stated in the table drawn up by Dr. Balfour, and published in Mr. Marshall's work "On the Enlisting and Discharging of Soldiers," second edition, 1839; but his observations were made on recruits about 19 or 20 years of age, and who are generally, at the time of enlistment, out of condition from their irregular habits and poor living. The mammary development, which adds greatly to the circumference of the chest, is increased by good diet; and a large number of the men I examined

between 16 and 20 years of age were fat from having recently come off a voyage from England.

On the Physical Strength of the New Zealanders.

Various instruments have been invented for measuring the strength of man, but as I had none of these within my reach I adopted the following method, which appears to me free from objection, and less liable to error than some of the more complicated apparatus. I arranged some weights on the ground in such a manner that both hands could be used in moving them; I then collected 31 New Zealanders, and ascertained what weight each could raise from the ground. The following are the results:—

6 raised 410 to 420 lbs.		6 raised 360 to 380 lbs.
2 „ 400 „ 410 „		5 „ 340 „ 360 „
5 „ 390 „ 400 „		2 „ 336 „
3 „ 380 „ 390 „		2 „ 250 „ 266 „

The mean weight raised by these men was 367 lbs., the greatest 420 and the least 250.

I then tried, in the same manner, 33 soldiers taken indiscriminately from the ranks, whose average weight, without clothes, was 10 stone 2 lbs., and obtained the following results:—

2 raised 504 lbs.		14 raised 400 to 460 lbs.
8 „ 460 to 480 lbs.		9 „ 350 „ 400 „

The average weight raised by these soldiers was 422 lbs., or 55 lbs. more than by the New Zealanders; the greatest was 504 lbs. and the least 350 lbs.

According to Professor Forbes, the average weight raised by the students of 25 years of age at the University of Edinburgh, as measured by Regnier's Dynamometer, was 416 lbs., and, according to Quetelet's observations, that raised by Belgians of 28 years of age was 339 lbs. It appears, therefore, that the New Zealanders are inferior in strength to the natives of Great Britain, but superior to the Belgians. The New Zealanders, however, who were the subjects of these experiments, were chiefly men employed on the government works, accustomed to lift weights, and better fed than many of their countrymen.

Peron in his "*Voyage des découvertes aux terres Australes*," states that the weakest Frenchman was equal in the hands to the strongest man of Van Dieman's Land, and the weakest Englishman stronger than the strongest New Hollander.

The New Hollander and the almost extinct Van Dieman's Landman are a very inferior race to the New Zealander. La Perouse made repeated trials of strength between his sailors and the inhabitants of the Navigators' Islands, a race very similar to the New Zealanders; he states that the result was not favourable to the French, and he partly attributes their misfortunes at one of the islands to the idea of individual superiority which these trials of strength suggested.

The great difference between the strength of the New Zealander and the British soldier is what would scarcely be anticipated, when

we consider how remarkably similar they are in stature, weight, and magnitude of chest. I am inclined to attribute the result to the New Zealander's diet being chiefly vegetable matter—potatoes; while the soldier's consists of a fair proportion of animal food.

To those who delight in thinking that the world is degenerating, and that men were stronger in the olden time before trade and civilization had changed their manners and customs, the foregoing facts may prove interesting, as they show that the New Zealanders—a race just emerging from the savage state—are inferior in physical strength to the natives of a country where the changes in the manners and habits of the people have been carried to an extent which ought to have manifested these disastrous consequences they so much deplore, did they really exist.

From the foregoing data the following seem to be legitimate deductions:—

1. That the average stature of the New Zealand race of men is 5 ft. 6½ in.
 2. That they are taller than the natives of Belgium or the temperate countries of Europe, but not so tall as the English.
 3. That their average weight, deducting clothes, is 140 lbs., or 10 stone.
 4. That they are about equal in weight to the natives of Great Britain, and heavier than those of Belgium.
 5. That the indolent life a New Zealander leads tends to increase their bodily weight.
 6. That the circumference of his chest is about 35 inches, a little under that of the British soldier.
 7. That the New Zealanders are inferior in physical strength to the natives of Great Britain, but superior to the Belgians.
 8. That their inferiority in this respect to the English soldier is, probably, in some measure attributable to the difference in their diet.
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